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BIM GATHERING

Building Capabilities in Complex Environments

CitA BIM Gathering 2017, Croke Park, November 23rd & 24th, 2017

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Data Quality …. Does It Matter To You?

Andrew Bellerby, Managing Director, Solibri UK Ltd

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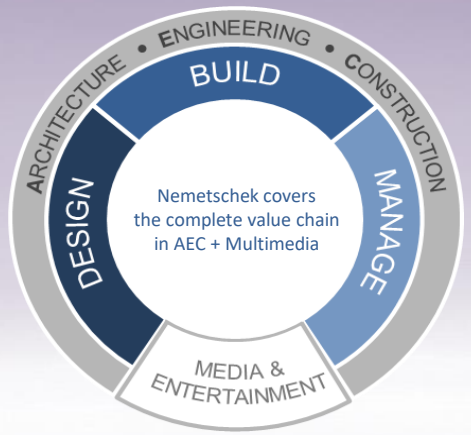
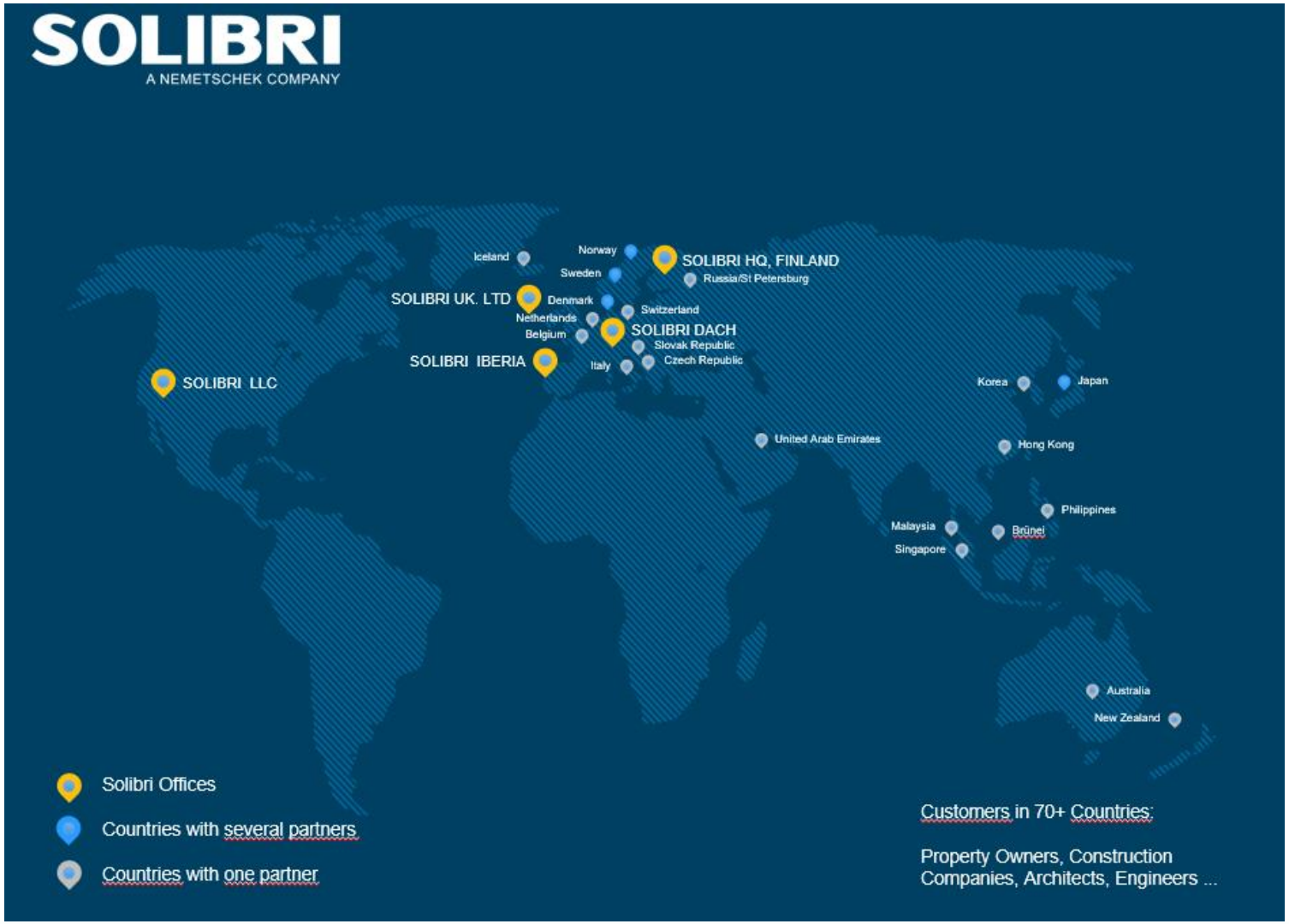
Four segments



Facts and figures

- > 50 years of innovation, founded in 1963 and headquartered in Munich, Germany
- Open BIM pioneer and 5D provider with software solutions for the AEC and media industry
- 14 strong brands
- 2.1 million users in 142 countries
- 1,800 employees worldwide
- > 50 locations in more than 40 countries
- 285.3 mEUR sales revenues (2015)
- IPO 1999, listed in the TecDax
- 2,0 billion EUR market capitalization

ALLPLAN · bluebeam · CREM SOLUTIONS · DATA DESIGN SYSTEM · dRofus · FRILO Software · GRAPHISOFT · MAXON · NEVARIS · PRECAST SOFTWARE engineering · RISA A NEMETSCHEK COMPANY · SCIA · SDS/2 A NEMETSCHEK COMPANY · SOLIBRI A NEMETSCHEK COMPANY · VECTORWORKS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Australia
New Zealand
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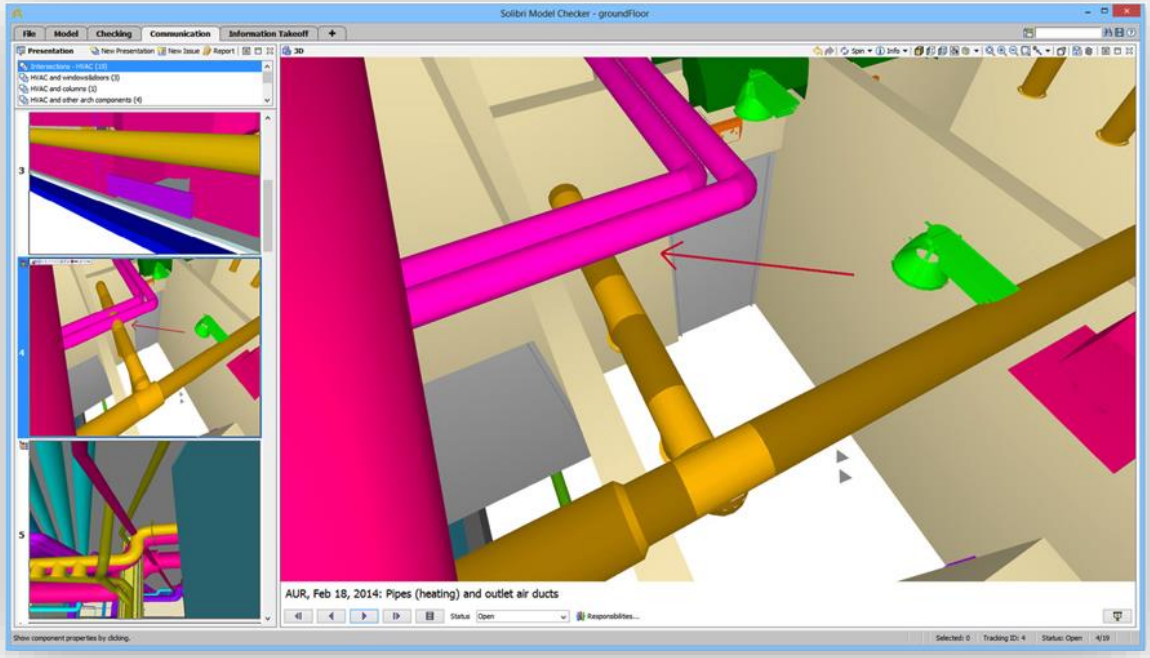
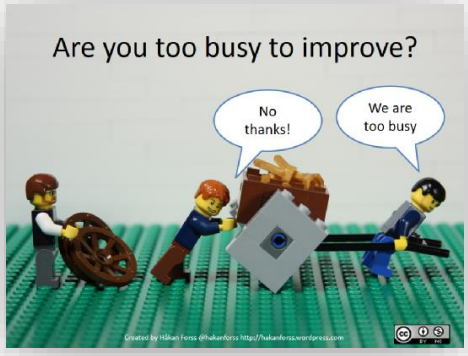
Countries with several partners
Countries with one partner
Customers in 70+ Countries:
Property Owners, Construction Companies, Architects, Engineers ...

Is it Enough To Only Do Clash Detection ?

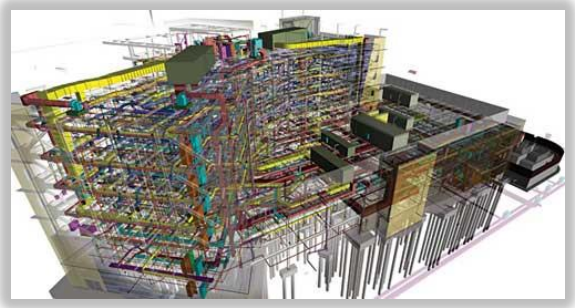


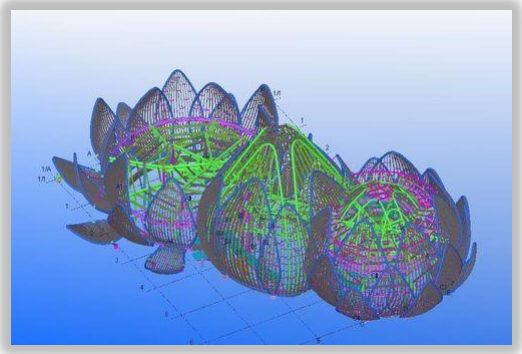
How do you Quality Assure your data as well as your geometry?

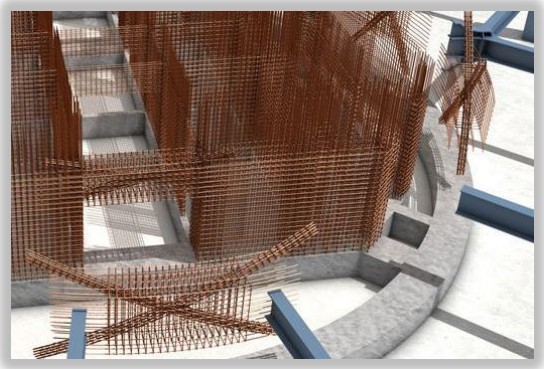
Is your model fit for purpose?



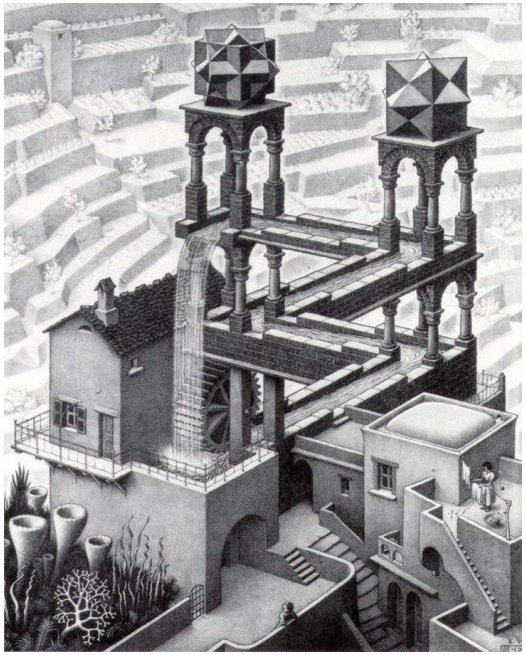
Fantastic Model Examples Everywhere

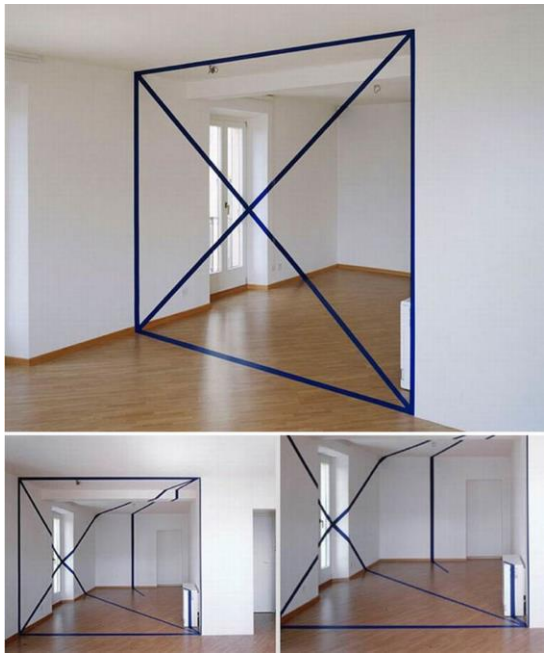






But Is Everything Quite What It Seems?





More or less every model we see has errors
People take shortcuts
Models often used primarily for drawings. As long as the drawing looks right …
Its not my job

What Is In A Building Information Model?

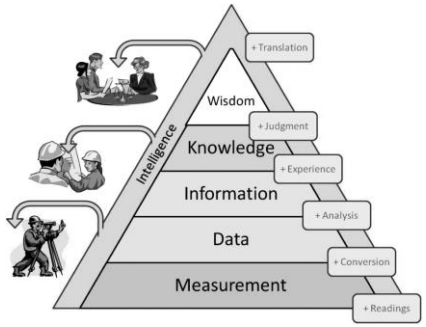
A Collection of Data

- Geometric shapes
- Components
- Objects/Families
- Relationships
- Attributes
- Constraints
- Classifications
- Metadata
- Other

Which Must Conform To …

- Standards (Industry, Company or Project)
- Different Protocols
- Regulations
- Best Practise

Data Quality Components



Timeliness – Is the data present when it is needed?

Completeness – Is all necessary data present?

Validity – Are the values used for the data acceptable?

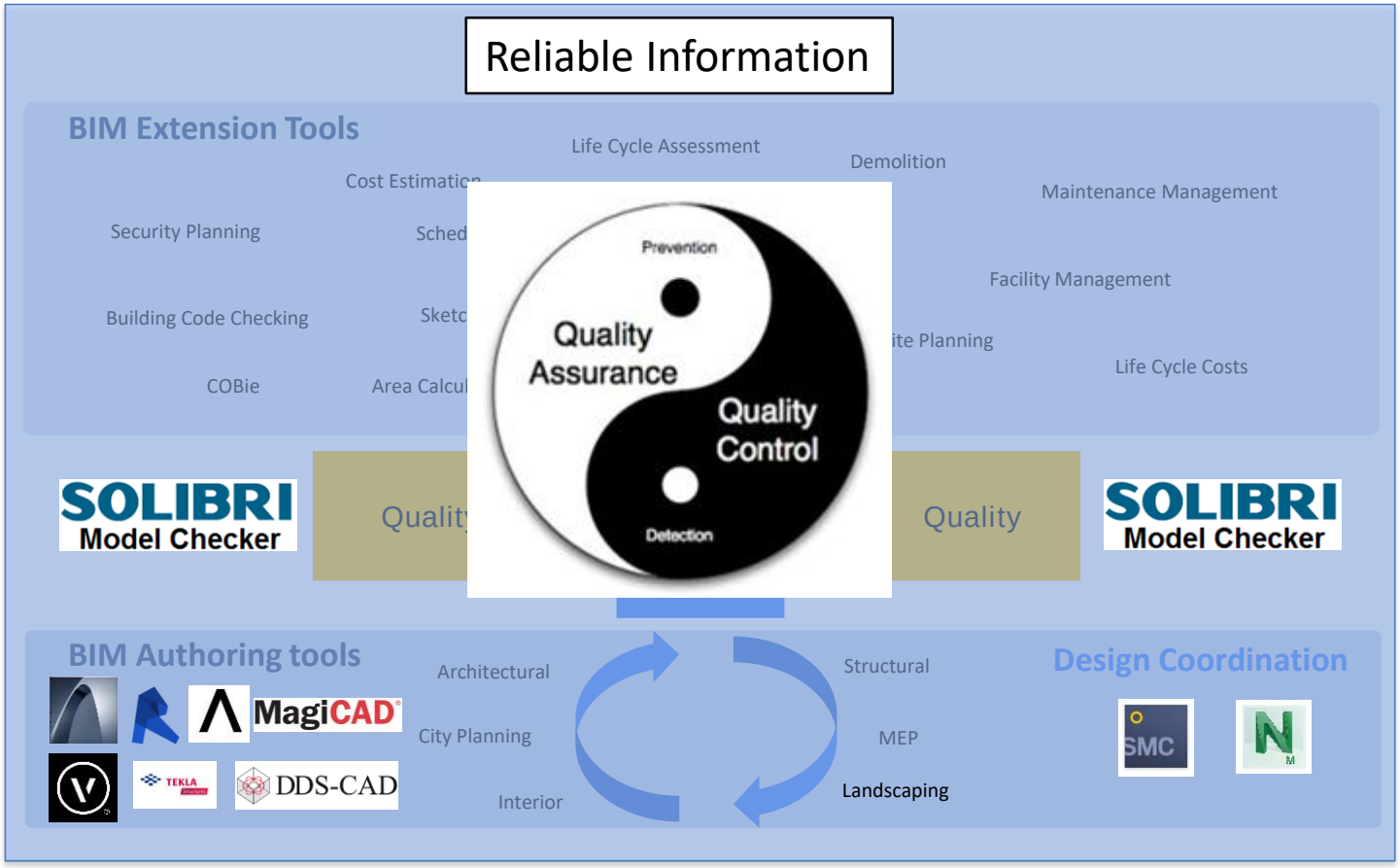
Accuracy – Does the data describe the properties of the object correctly?

Consistency – Is data consistent between systems? Do duplicate records exist?

Integrity – Is the relationship between data elements and data sets accurate?

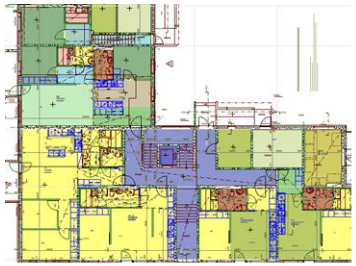
What good is data if you don't know its accuracy completeness, or compliance with an established and agreed requirement?

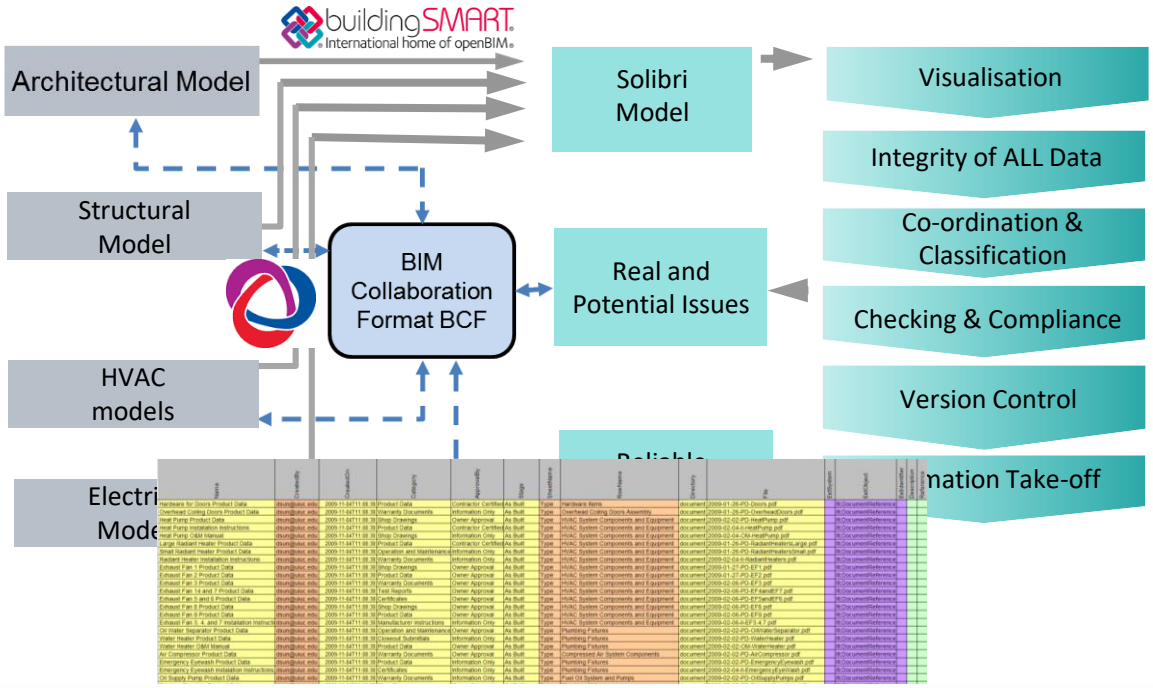
From Modelling and Data …..



To INFORMATION utilization, exploitation and consumption.

Solibri Model Checker QA/QC Workflow





Model Checking - Rulesets

WORKSPACE

Name

- BIM Coordination
  - General
    - 1.0 File Name
      - § 1.1.0 File Name
    - 2.0. Datum Point
      - § 2.0.1. Model has a coordinate figure
      - § 2.0.1.1. Coordinates match BEP figure
      - § 2.0.2. Model has a rotation figure
      - § 2.0.2.1. Coordinate rotation match BEP figure
    - 3. Levels
      - § 3.1. Level Name
      - § 3.2. Building Levels
    - 4. Geometry
      - § 4.1. Architecural Duplicates
      - § 4.2. Structural Duplicates
      - § 4.3. MEP Duplicates
  - Model Coordination
    - 1. Architecture vs Structures
      - § 1.1. Architectural Models vs Structural Beams
      - § 1.2. Architectural Models vs Structural Columns
      - § 1.3. Architectural Models vs Structural Slabs
      - § 1.4. Architectural Models vs Structural Walls
      - § 1.5. Architectural Models vs Structural Other
      - § 1.6. Architecural Doors and Windows vs Structural Model
      - § 1.7. Architectural Models - Structural Models objects in front of doors and windows
      - § 1.8. Architectural Models - Structral Models objects are the same size and in the same location

WORKSPACE

Name

- 2. Architecture vs MEP
  - § 2.1. Architectural Slabs vs MEP Models
  - § 2.2. Architectural Walls vs MEP Models
  - § 2.3. Architectural Other vs MEP Models
  - § 2.4. Architectural Doors/Windows vs MEP Models
  - § 2.5. Architectural Interiors vs MEP Models
  - § 2.6. Architectural Models - MEP Models objects above ceilings
  - § 2.7. Architectural Models - MEP Models objects in front of doors and windows
- 3. Structures vs MEP
  - § 3.1. Structural Beams vs MEP Models
  - § 3.2. Structural Columns vs MEP Models
  - § 3.3. Structural Slabs vs MEP Models
  - § 3.4. Structural Walls vs MEP Models
  - § 3.5. Structural Other vs MEP Models
- 4. Landscape Architect
  - 4.1. Architecture vs Landscape Architect
    - § 4.1.1. Architectural Beams and Columns vs Landscape Architect Model
    - § 4.1.2. Architectural Doors and Windows vs Landscape Architect Model
    - § 4.1.3. Architectural Interiors vs Landscape Architect Model
    - § 4.1.4. Architectural Other vs Landscape Architect Model
  - 4.2. Structures vs Landscape Architect
    - § 4.2.1. Structures vs Landscape Architect
  - 4.3. MEP vs Landscape Architect
    - § 4.3.1. MEP vs Landscape Architect

A Few Examples of Quality Assurance and Control Checks

Who Benefits ?

Architect

MEP

Structural

Contractor

Civil

HVAC

Facilities Manager

BIM/Information Manager

Owner

Checking “Non Clashes”

INFO

Name: 2.7. Architectural Models - MEP Models objects in front of doors and windows

Description: Edit

This ruleset check that there are no components too close to doors and windows

Author: Solibri, Inc.

Version: 1.0

PARAMETERS — Revert Changes — Severity Parameters

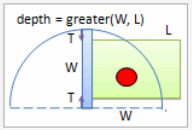
Checked components

State	Component	Property	Operator	Value
Include	Window			
Include	Door			

Free area width tolerance T: 50 mm

Free area depth limiter L: 50 mm

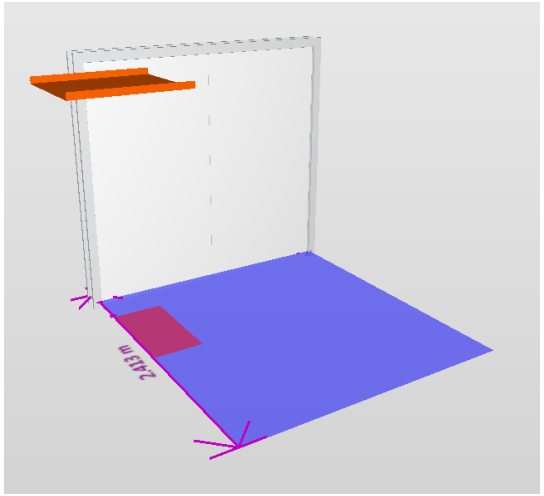
Use 'depth limiter L' as: Minimum area depth in front of component



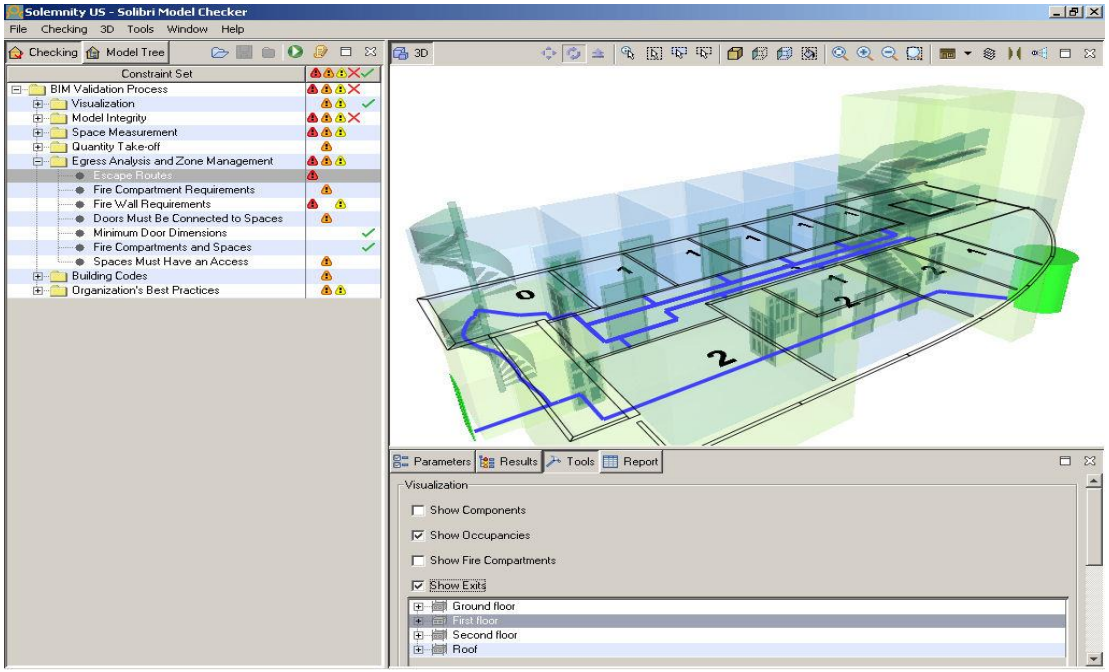
Components exceptionally allowed in free area

State	Component	Property	Operator	Value
Include	Any	Discipline	None Of	[Air Conditioning, Build...

A rule to check space in front of windows or doors that may impede on the view or opening of the window or door.

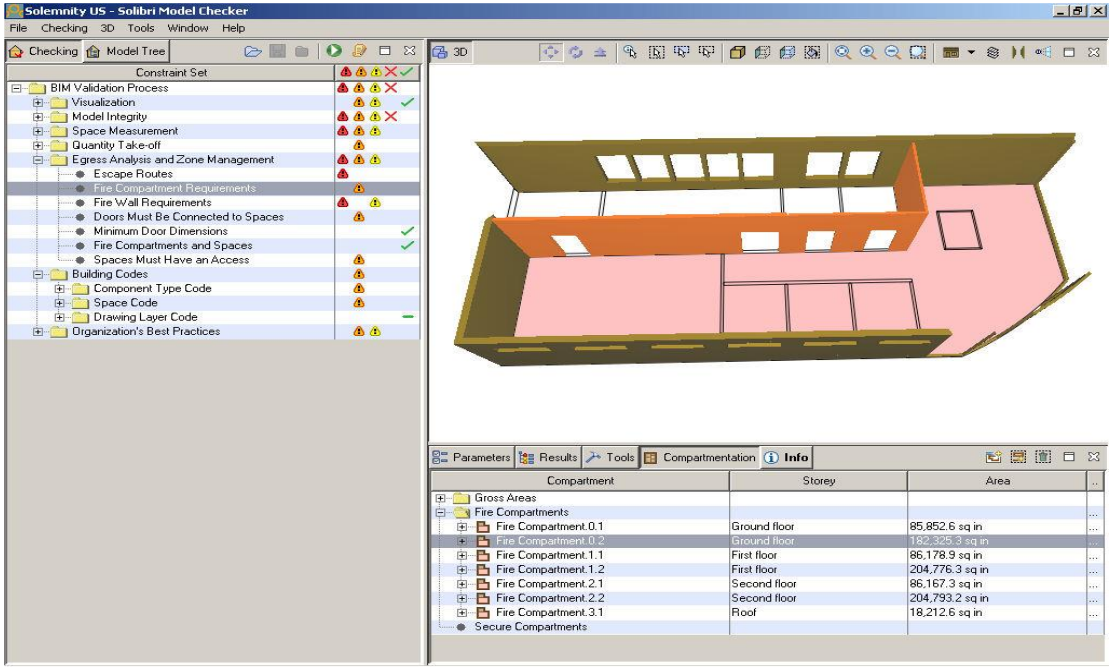


Egress and Occupancy



Perhaps the most sophisticated rule in Solibri's Model Checker using our spatial awareness for types of spaces and algorithms to calculate distances for escape routes to the nearest fire exit and then visually map them into the model and checking conformance against maximum permitted distance

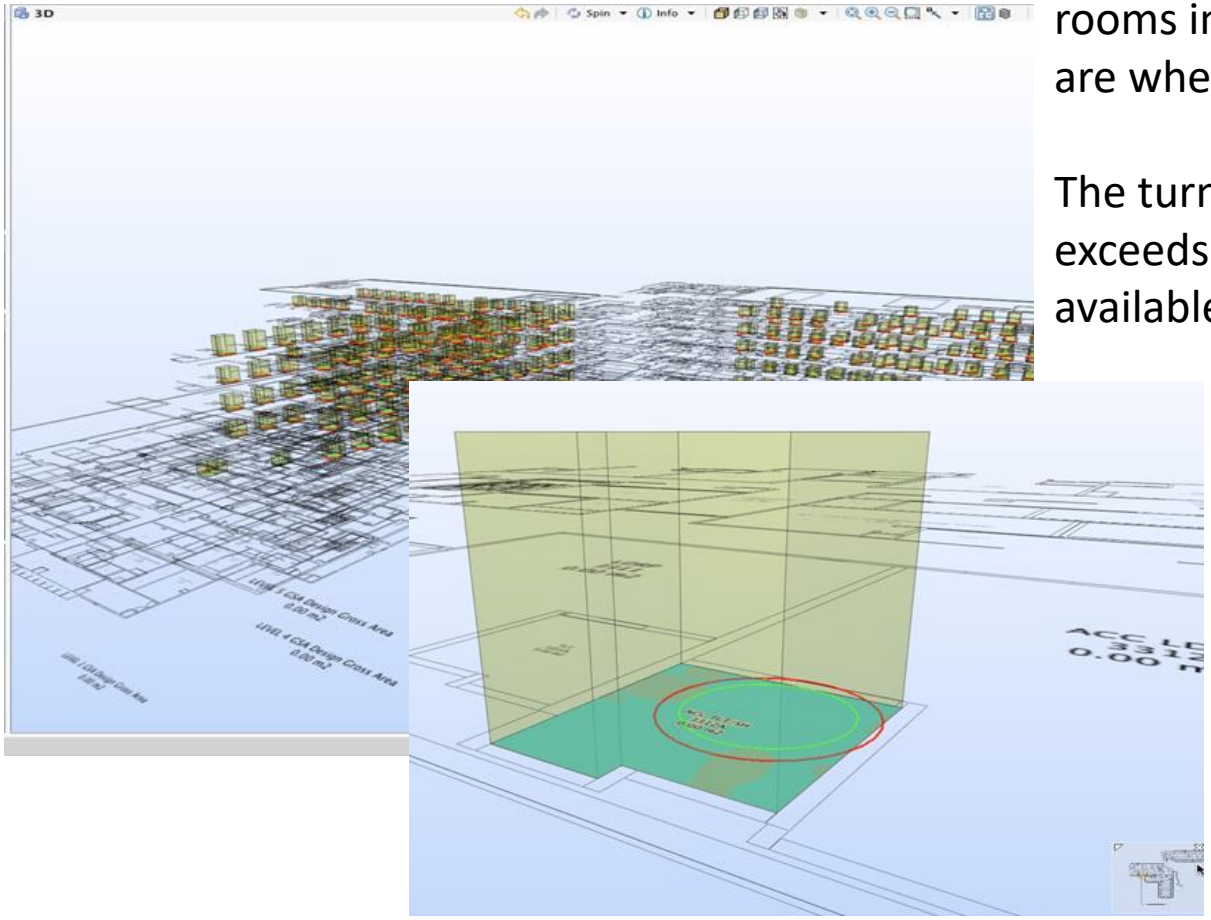
Fire Zones



The second rule in the egress ruleset is checking fire zones and in this particular example we have a fire zone which has failed the check as it isn't a secured compartment

Other rules will check fire ratings on walls and also visually display that information

Checking Accessibility

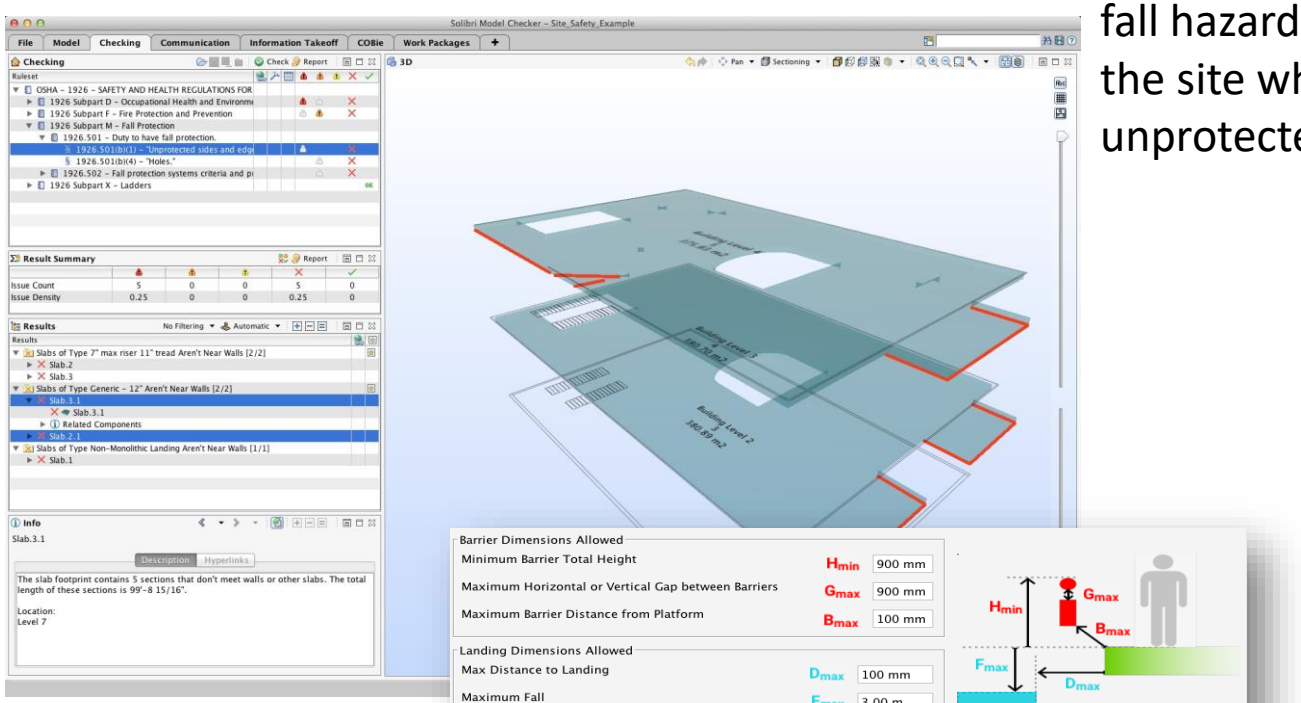


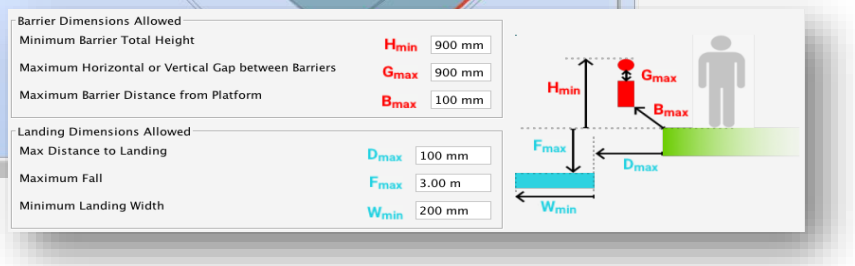
This check has highlighted many rooms in a hospital where there are wheelchair access problems.

The turning circle required (in red) exceeds the maximum space available (in green).

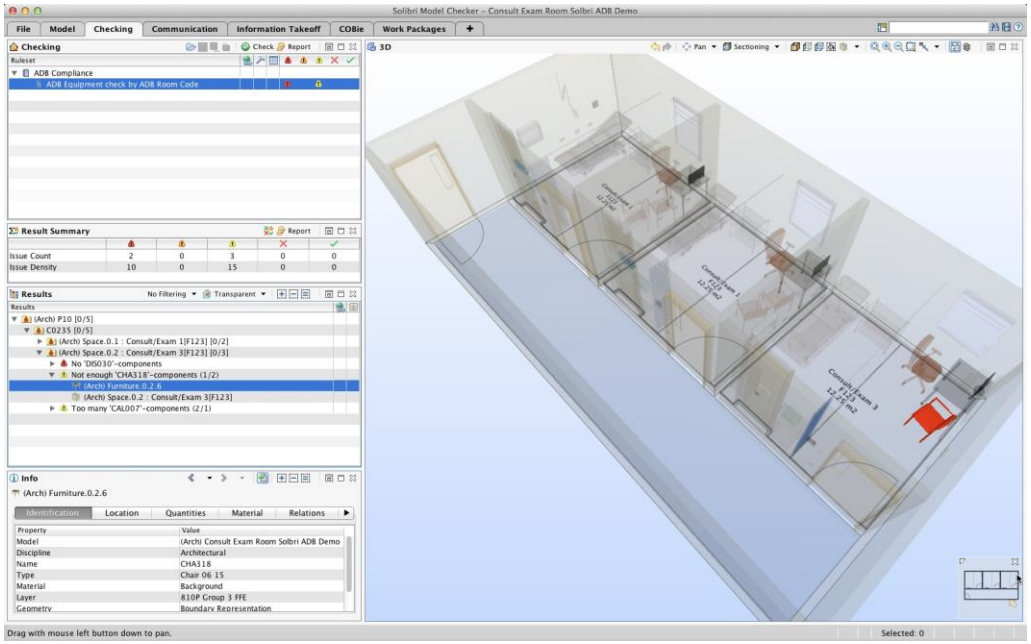
Safety Checks

This rule will automatically check fall hazards and flag any gaps on the site where there are unprotected edges.



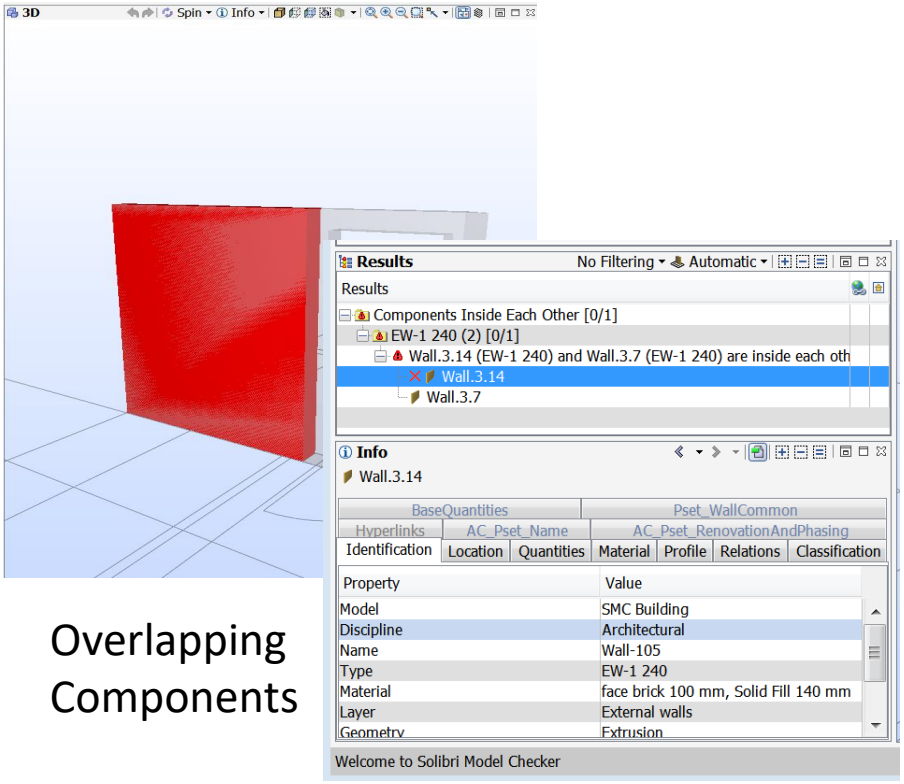


Missing Components

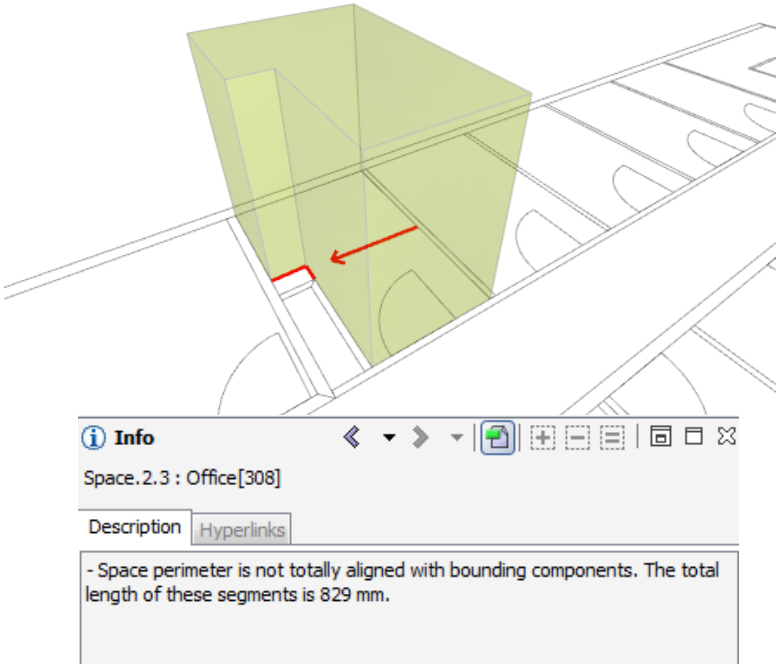


Solibri is also very good at checking for things that are missing.
In this example, 3 consulting rooms in a hospital should all have the same standard equipment according to the room data sheets from the NHS.
Because we know the type of space we can check all specified equipment is present against an external table
Solibri has checked two of the consulting rooms and found they conform to the required specification but the third room has a patient chair missing.

Other Checks



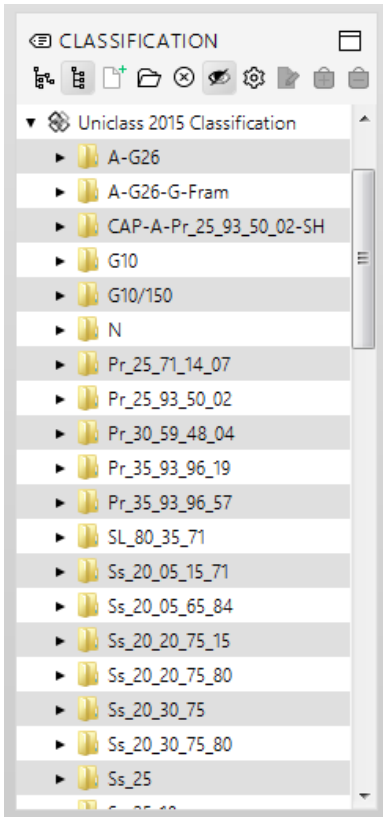
Overlapping Components



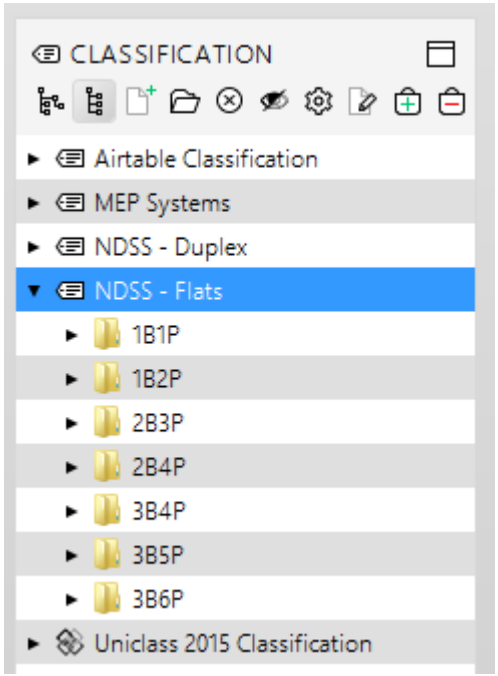
Space Validation

Classifications

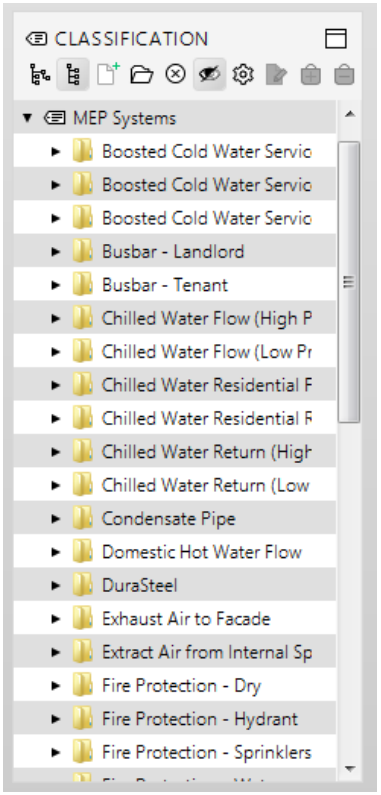
Classifications in Solibri are a way of filtering the model and visualising data and when combined with our Information Take Off functionality it provides a powerful tool



Uniclass 2015

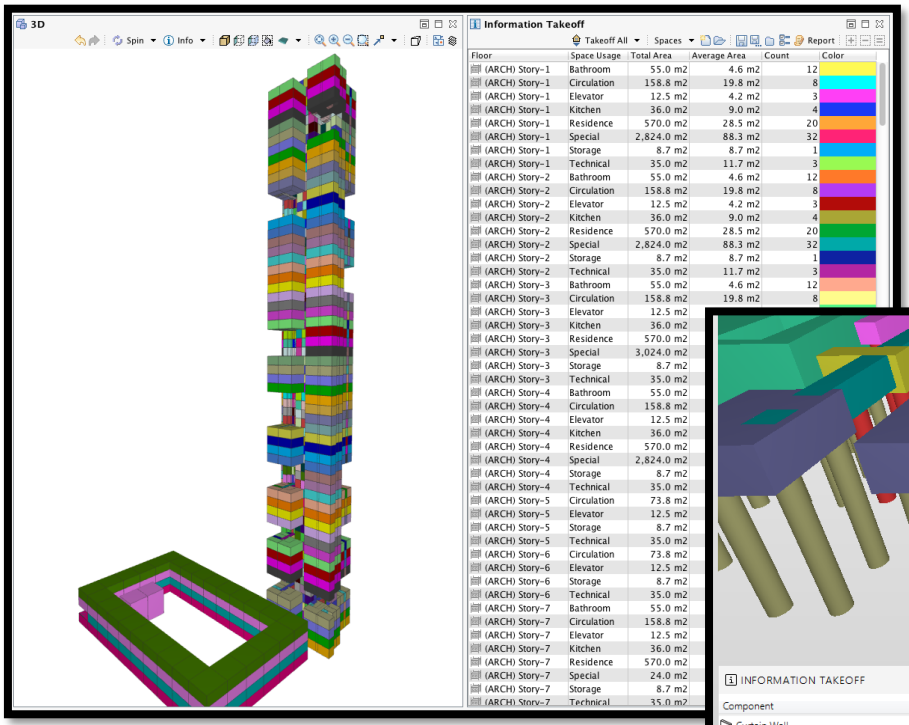


NDSS



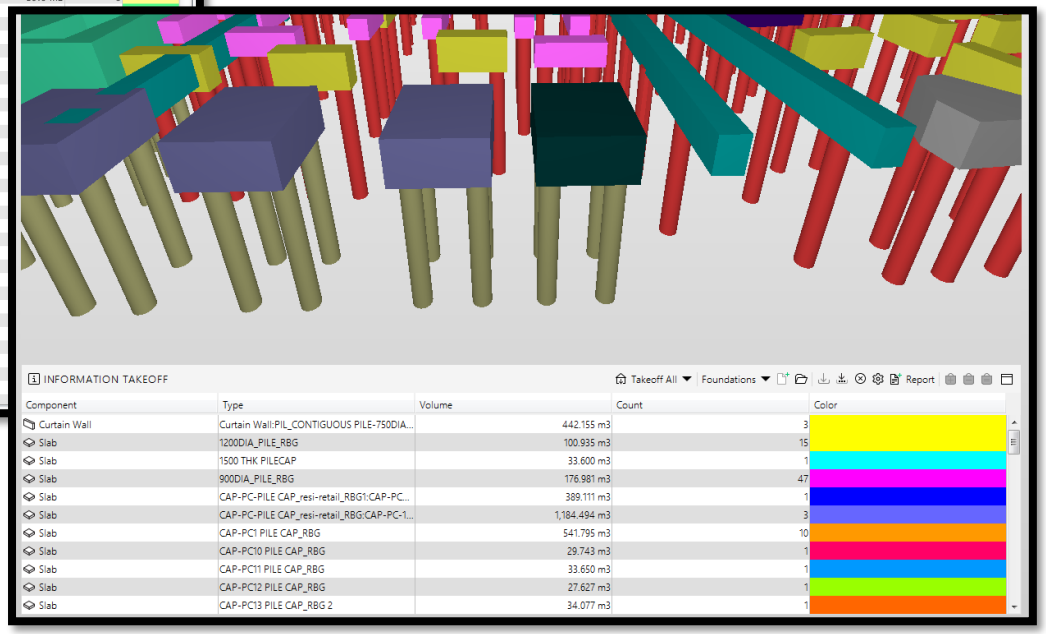
MEP Systems

Information Take Off



Concrete Volumes

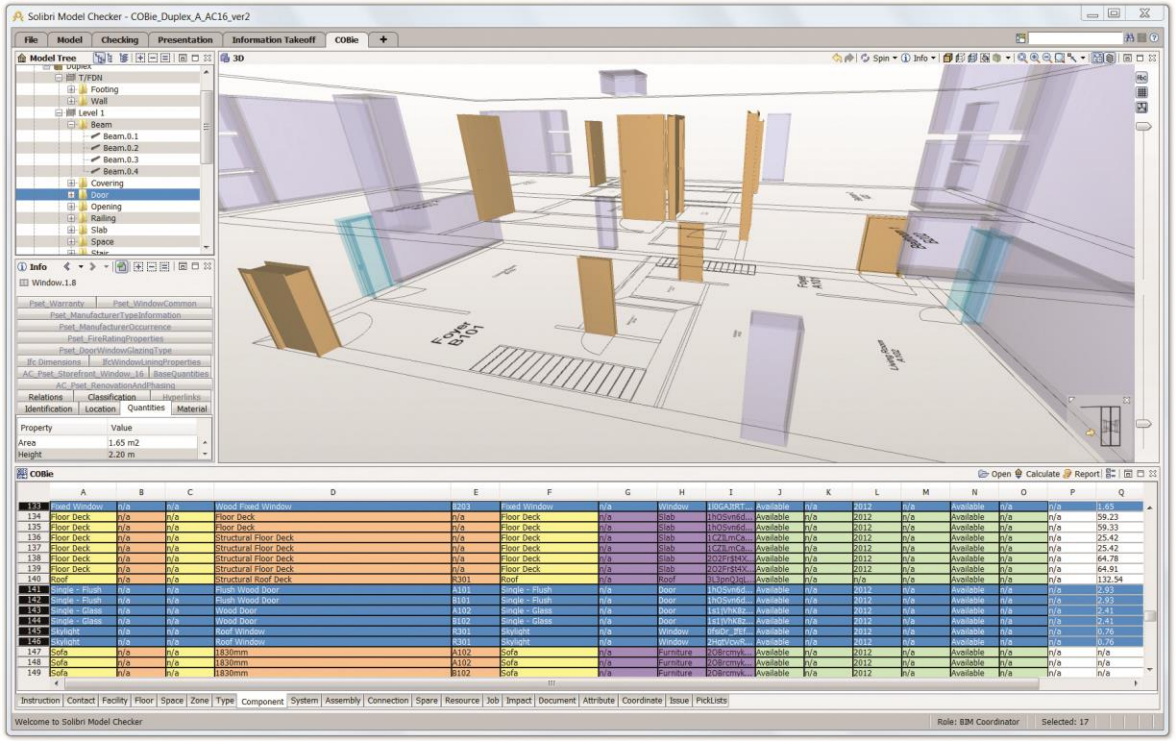
By Grade
By Type
Etc



Space Usage

Room Type and Count
Floor Area
Volume

Information Take Off - COBie



Is it enough to generate COBie deliverables without first of all validating the content?

Visual COBie data allows bi-directional querying and interrogation

In Summary - Data Quality …. Does It Matter To You?

One thing is abundantly clear, now data is becoming more prevalent in models there is a very real requirement to manage that data.

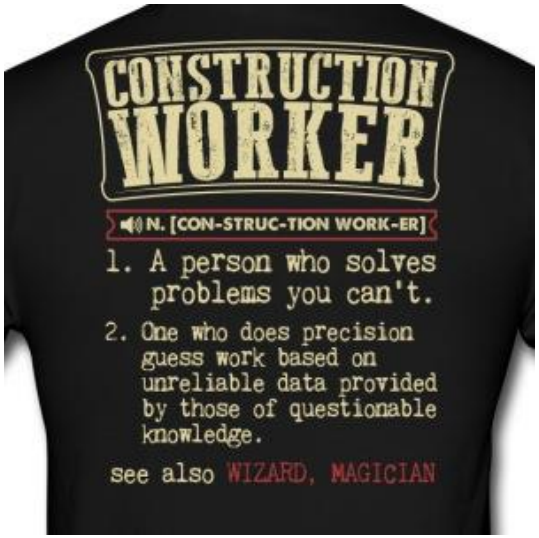
However, if it has not been verified and validated then have you the confidence to use it?

What good is data if you don't know its accuracy, completeness, or compliance with an established standard?

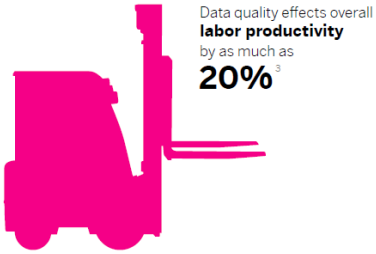
Data used without validation is an educated guess

Bad data will result in inaccuracies later in the project (estimating, procurement, calculations, delays, site changes etc)

It will directly impact your bottom line!



But is data quality really that important?



Source: Gartner, Measuring the Business Value of Data Quality Published: 10 October 2011

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Andrew Bellerby

THANK YOU